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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,650	07/30/2003	Tsutomu Kadotani	Q76784	6845

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EXAMINER	
DUONG, THOI V	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/629,650	KADOTANI, TSUTOMU	
	Examiner	Art Unit	
	Thoi V. Duong	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-10 and 21-23* ~~is~~/are pending in the application.

4a) Of the above claim(s) *11-20* ~~is~~/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-10 and 21-23* ~~is~~/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment filed September 12, 2006.

Accordingly, claims 1 and 22 were amended, and claims 2-4 were cancelled. Currently, claims 1 and 5-23 are pending in this application; of these claims, claims 11-20 were withdrawn and claims 1, 5-10 and 21-23 are considered in this office action.

Response to Arguments

2. Applicant's arguments with respect to claims 1 and 22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 5-7, 10, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jun et al. (Jun, US 6,873,391 B2) in view of Iguchi (JP 2000-314893).

Re claim 1, as shown in Figs. 4-6, Jun discloses a LCD device comprising:

a first substrate 1 on which pixels are arranged (Fig. 5 and col. 3, lines 30-44);

a second substrate 5 coupled to the first substrate 1 with a sealing member 2 in such a way as to form a gap between the first and second substrates (Figs. 4 and 6 and col. 3, lines 45-67); and

a liquid-crystal layer 3 formed in the gap, the liquid crystal layer 3 being confined by the sealing member 2,

wherein the LCD device comprises a display region (active region) for displaying images and a non-display region (outside the active region) which does not display images (col. 3, lines 30-44);

wherein the display region includes the pixels (col. 3, lines 30-44);

wherein the non-display region is disposed between the display region and the sealing member 2 (Fig. 6); and

wherein a first part of the liquid-crystal layer 3 corresponds to the display region and a second part of the liquid-crystal layer 3 corresponds to the non-display region.

The LCD device further comprises a depression 13 (groove) formed on an inner surface of the first substrate 1 as shown in Figs. 5 and 6, wherein the depression 13 is located in the second part of the liquid crystal layer 3, and the depression13 constitutes a buffer space which receives excess liquid crystal from the liquid crystal layer (col. 4, lines 21-30 and 44-49).

Re claim 22, as shown in Figs. 4-6, Jun discloses an LCD device comprising:

a first substrate 1;

pixels disposed on the first substrate 1 (col. 3, lines 30-44);

a second substrate 5 coupled to the first substrate 1;

a sealing member 2 creating a gap between the first substrate 1 and the second substrate 5; and

a liquid crystal layer 3 disposed in the gap,

wherein the LCD device comprises a display region (active region) for displaying images and a non-display region (outside the active region) which does not display images (col. 3, lines 30-44);

wherein the display region includes the pixels; and

wherein the non-display region is disposed between the display region and the sealing member 2.

As shown in Figs. 5 and 6, the LCD device further comprises a depression 13 (groove) which receives excess liquid crystal from the liquid crystal layer (col. 4, lines 21-30 and 44-49) so as to accommodate relatively large variations in the liquid crystal layer (col. 4, lines 44-49).

Jun discloses a LCD that is basically the same as that recited in claims 1 and 22 except for the spacers being arranged only in the display region and not in the non-display region.

As shown in Fig. 2, Iguchi discloses a LCD device comprising:

spacers 5 disposed in the liquid crystal layer; and

a display region 4a for displaying images and a non-display region 4b which does not display images,

wherein the non-display region 4b is disposed between the display region 4a and the sealing member 6 (Fig. 2); and

wherein the spacers 5 are arranged only in the display region 4a and not in the non-display region 4b so as to prevent changes in a gap width in the display region 4a (see Abstract).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD of Jun with the teaching of Iguchi by arranging spacers only in the display region and not in the non-display region in order to prevent changes in a gap width in the display region 4a (see Abstract). Accordingly, with the modification, it is obvious that the gap between the first substrate and the second substrate is substantially uniform in the display region.

Re claim 5, as shown in Figs. 5 and 6, Jun discloses that TFTs are arranged on the first substrate 1 in such a way as to be electrically connected to the respective pixels, and a dielectric layer 12 (patterned material) is formed on the first substrate 1 to cover the TFTs and the pixels; and wherein the depression 13 is formed in the dielectric layer 12 (col. 3, lines 30-45).

Re claim 6, Jun also suggests that a dielectric layer is formed on the second substrate; and wherein the depression is formed in the dielectric layer (col. 4, lines 30-33-43).

Re claim 7, Jun suggests that one of the first and second substrates comprises a transparent plate and the depression is formed on an inner surface of the plate (col. 3, lines 22-29 and col. 4, lines 38-42).

Re claim 10, as shown in Figs. 5 and 6 of Jun, the depression 13 forms a step between the display region and the non-display region.

Re claim 21, the LCD device of Jun further comprises a dielectric overcoat layer on at least a portion of the second substrate; wherein the dielectric overcoat layer comprising a depression is formed by photolithography technique (col. 3, lines 37-39

and col. 4, lines 1-8 and 30-43). Accordingly, it is obvious that at least a portion of the dielectric overcoat layer in the second part of the liquid-crystal layer is selectively etched by photolithography technique to remove portions of the dielectric overcoat layer and form the depression.

However, as to the product-by-process limitation "wherein at least a portion of the dielectric layer is selectively etched to remove portions of the dielectric overcoat layer and form the depression" of claim 21, it has been recognized that "Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process". *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

5. Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jun et al. (Jun, US 6,873,391 B2) in view of Iguchi (JP 2000-314893) as applied to claims 1, 5-7, 10, 21 and 22 above, and further in view of Kijima et al. (Kijima, US 6,259,500 B1).

The LCD device of Jun as modified in view of Iguchi above includes all that is recited in claims 8 and 23 except for the depression having a height H satisfying a relationship of

$$H => (1/2) \times (1000 + L) \times [0.02d + [L \times (0.02d/1000)]]/L \text{ (micrometer)},$$

when the non-display region has a width L and the gap in the display region has an average value d.

Kijima discloses an LCD device having spacers formed in the display region and none of the spacers being formed in the non-display region (Fig. 8b).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the relationship H => (1/2) x (1000 + L) x [0.02d + [L x (0.02d/1000)]]/L satisfied (col. 16, lines 17-46), since one would be motivated to suppress the level of non-uniformity due to variation in cell thickness to an acceptable level so that a convex/concave profile can be provided (col. 16, lines 17-47). Ultimately this serves to help realize a uniform cell thickness across the entire panel and improve display quality (col. 5, lines 7-29).

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jun et al. (Jun, US 6,873,391 B2) in view of Iguchi (JP 2000-314893) as applied to claims 1, 5-7, 10, 21 and 22 above, and further in view of Kurauchi et al. (Kurauchi, US 5,917,572).

The LCD device of Jun as modified in view of Iguchi above includes all that is recited in claim 9 except for the spacers being pole-shaped and formed on one of the first and second substrates.

As shown in Figs. 6 and 7, Kurauchi discloses a LCD comprising spacers 83 being pole-shaped (pillar-shaped spacers) and formed on a substrate 81 (col. 9, lines 2-5).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Jun with the teaching of

Kurauchi by having the spacers being pole-shaped and formed on one of the first and second substrates so as to obtain a uniform gap and enhance display performance (col. 2, lines 54-59).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms, can be reached at (571) 272-1787.

Thoi V. Duong 

11/21/2006